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ABSTRACT

Officials at a number of higher education institutions have shown that considerable discrepancies exist in faculty salaries, corresponding to sex differences. To date, there has been no satisfactory way to examine the relationship between faculty accomplishments and rewards in the merit system. This study was undertaken to assess the nature of reward discrepancies, using self-assessments by a group of faculty members on 14 measures of reward and 46 measures of accomplishment. With the use of conventional statistical analyses, it was determined that (1) the reward system is more complex than originally assumed, since personal values play an important role; (2) not surprisingly, the structure of faculty accomplishments is complex; (3) two of the reward factors, travel and professional development assistance, are unrelated to accomplishment; and (4) the charge of sex discrimination is supported on only the monetary reward dimension. (MSE)

FACULTY REWARDS, FACULTY ACCOMPLISHMENTS, AND SEX DISCRIMINATION

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The slogan, "Equal pay for equal work", has a competitor in many colleges and universities -- "Unequal pay for unequal effectiveness". In such institutions, the lockstep of rigid salary schedules based on highest degree and length of service has been replaced by the concept of merit pay. In some states, legislators, reacting to the bankers hours kept by a few faculty members, have decreed that all salary increases in state-supported institutions shall be based on merit. This reflects the state of affairs in Kansas for the past several years.

Interestingly, the merit philosophy has been employed to explain some otherwise embarrassing statistics. The absence of faculty members from minority races has commonly been explained on the basis of the shortage of qualified candidates. Similarly, differences in the distributions of rank and salary between the two sexes has occasionally been "explained" by their presumed difference in merit.

It was the latter circumstance which led to the investigation reported in this paper. Prior to the design of this study, officials at a number of institutions, including the state universities in Kansas, had published information

showing sizeable discrepancies in the salaries paid to faculty members of the two sexes. Official or unofficial representatives of faculty women interpreted these findings to mean that discrimination on the basis of sex had occurred and requested upward adjustments in salaries for women to make them equal to those for men. Administrators who were either courageous or chauvinistic or both responded by saying that the merit system guarantees unequal rewards among faculty members, and if the two sexes were treated differently, it must be because they have performed with differential effectiveness.

Alternative interpretations of this type often provide the stimulus for worthwile applied research projects (Stewart, 1972). There were a number of problems which needed to be dealt with before an investigation of this controversy could occur.

1. Aside from fields traditionally dominated by women (e.g., home economics, nursing) the number of female faculty members was so small that it would be difficult to attain much rigor in any study.

2. Faculty rewards may assume many forms besides salary (travel opportunities, office space, secretarial help, summer employment, etc). An investigation of alleged bias would need to provide as comprehensive assessment as possible of the reward status of male and female faculty members.

3. The merit system avows that rewards should be based

on accomplishments. But, aside from routine measures like number of credit hours taught or number of publications, there has been no standard system for categorizing or measuring faculty accomplishments. Therefore, there has been no satisfactory way of examining the relationships between faculty rewards and faculty accomplishments.

Procedure

To resolve these problems, several steps were taken:

1. The study was limited to those disciplines which have traditionally employed faculty members of both sexes. These included the social and behavioral sciences, the humanities, and education.

2. A form was devised for faculty members to record their status on each of 14 measures of reward. The particular measures included: rate of promotion, salary, salary adjusted for experience, in-state and out-of-state travel support, tenure status, four measures of the adequacy of the faculty member's office, secretarial assistance, treatment with respect to sabbatical leaves or leaves without pay, and summer teaching opportunities.

3. The same form was used to assess numerous types of faculty accomplishment: dedication to and success in teaching (5 measures), grantsmanship (3 measures), scholarly productivity (15 measures), institutional service (4 measures), community service (5 measures), professional service (3 measures), and instructional workload (11 measures).

Sample

A listing was obtained of all faculty members who were employed in 1971 at one of the three state universities in Kansas. The 271 who had been employed in the following disciplines for at least six years were asked to participate: English, speech, history, political science, economics, psychology, journalism, languages, anthropology, and sociology. The six year stipulation was necessary because we needed those for whom a dependable record of rewards and accomplishments were available. A total of 212 (78 percent) returned completed questionnaires. However, 51 of these were considered unusable, either because they were employed only part time or because they spent at least half of their time in administrative duties. Of the remaining 161, only 24 were women.

Statistical Analyses

Principal component analyses were undertaken to determine if the 14 reward measures and 46 accomplishment measures might be adequately represented by a fewer number of dimensions. All factors with eigenvalues greater than 1.0 were rotated by the Varimax procedure.

Factor coefficients were used to compute factor scores for each member of the sample. The plan called for using the male sample to determine the relationship between accomplishment scores and reward scores. Step-wise multiple regression analyses were performed to develop equations for predicting rewards from accomplishments.

Assuming that these analyses would yield positive results (i.e., that rewards were shown to be a function of accomplishments for the male sample), the next step was to apply the male regression equations to female accomplishment data. This would yield estimates of the rewards which females could expect had their accomplishments been rewarded in the same way that those for males were. By subtracting predicted reward from obtained reward, a discrepancy score could be obtained. We hypothesized that the mean discrepancy score would not differ for males and females, and tested this hypothesis with a "t" test.

Results

Structure of Rewards

Two of the reward measures (tenure status, leaves without pay) had to be excluded because they failed to differentiate among the members of the sample (nearly all had tenure, hardly any had requested a leave without pay). For the remaining 12 measures, principal component analysis yielded five factors with eigenvalues greater than 1.0, accounting for 69.8 percent of the total variance. Table 1 displays the major findings from this analysis.

INSERT TABLE 1

At least four of the five factors lend themselves to unambiguous interpretation -- office quality, monetary, professional development assistance, and travel. The fifth, tentatively labelled "Summer appointment" because of the .85 loading associated with summer teaching, is somewhat clouded

by the modest loadings associated with out-of-state travel and secretarial help. Perhaps the dimension it depicts could better be named "Favoritism regarding informal fringe benefits".

Structure of Accomplishments

The 46 accomplishment measures were reduced to a total of 36 by combining certain measures. For example, reports on number of poems, short stories, novels, and magazine articles were incorporated with the measure of refereed journal articles; likewise, several measures of teaching effort were combined to yield measures called "teaching level" and "teaching load".

Principal component analyses yielded 11 factors with eigenvalues greater than 1.0. After rotation, a straightforward interpretation of the last two factors was not possible. Rotations of 10 and 9 factors were also tried. The latter appeared to offer a solution which could be most easily interpreted. The 9 factors accounted for 57.3 percent of the variance.

Table 2 names each factor, shows the percent of variance accounted for by each, and gives the factor loadings for those items which, after rotation, loaded at least .40. The table shows that faculty activities and accomplishments were at least as diverse as they are reputed to be. The common conceptualization of faculty activity as teaching, research, and service appears overly simplistic.

- INSERT TABLE 2

Teaching appeared to be represented by three different factors. (IV, VIII, and IX). And "service" was represented by four independent dimensions (II, III, VI, and VII).

The fact that these nine factors accounted for only 57.3 percent of the variance suggests that faculty accomplishment is a very complex domain of behavior and that the instrument used in this study was only partially successful in tapping that domain.

Regression Analyses

Factor score coefficients were computed from the principal components analyses. In addition, standard "z" scores were computed for each faculty member on each of the 12 reward measures and each of the 36 accomplishment measures. By multiplying corresponding factor score coefficients and z scores, five reward factor scores and nine accomplishment factor scores were obtained for each subject. An attempt was made to predict each reward factor score from the accomplishment factor scores. Only the 137 males in the sample were used for this purpose.

Table 3 summarizes the results of the step-wise multiple regression analyses. Status on two of the reward measures (office quality, summer appointment) were unrelated to accomplishment factor scores, singly or in combination.

INSERT TABLE 3

The other three reward factor scores could be predicted on the basis of accomplishment factor scores. However,

only the monetary reward factor was predicted with reasonable accuracy. (R=.69).

As Table 3 shows, the chief predictors of the monetary factor were scholarly visibility and university service; the beta weight for "credentials versus teaching load" was also significant. Those who received the most generous monetary rewards were the most visible scholars, those most heavily involved in university wide governance, and, to a lesser degree, those with doctoral degrees whose teaching loads were relatively light but at an advanced level.

Predictions of the factors labelled "professional development assistance" and "travel", while statistically significant, had little explanatory potency. Those with good records of community service and of teaching excellence were especially likely to obtain sabbaticals or secretarial assistance. The best single predictor of travel was professional leadership at the state level; and although "university service" and "teaching involvement" also entered the equation, these three predictors accounted for only 11 percent of the criterion variance.

Sex Comparisons

For the three reward factor scores which were related to faculty accomplishments, discrepancy scores were computed by subtracting each subject's actual reward status from status predicted on the basis of accomplishment. A simple "t" test was used to determine if the mean discrepancy score

for the two sexes differed by an amount greater than could be explained by chance. Table 4 summarizes the findings.

INSERT TABLE 4

By definition, the mean discrepancy score for males was 0.00 on all criteria. For females, all three means were negative; that is, average reward scores were below predicted reward scores. However, the difference was significant only in the case of the monetary factor, where rewards averaged almost half a standard deviation below prediction.

Discussion

The study has obvious limitations both in terms of the sample and in terms of the measuring devices. It would be desirable to expand the sample to include more institutions, more disciplines, and more women. Hopefully, more refined measures of accomplishment can be devised, particularly with respect to teaching effectiveness. These limitations form a necessary framework for discussion.

1. Nature of Rewards. Apparently, administrators have multiple options for rewarding faculty members; the discovery of five independent dimensions was unexpected. Since reinforcement is generally acknowledged to be a potent factor in behavior, it may be possible, by judiciously selecting reward options, to reinforce more faculty members than we have been. In addition, it may be possible to provide more meaningful reinforcement by learning about the personal values of the individual faculty member: If a good office has high value for one, while an expense-paid convention

means more to another, it may be possible to reward both without exhausting resources.

2. Nature of Accomplishments. It was not particularly surprising to discover the complex structure of faculty accomplishment. Any casual observer of university activities is aware that faculty members are into lots of different things. The standard triumvirate -- teaching, research, and service -- were all represented more than once. Research was reflected primarily in the "scholarly visibility" factor but also in "reputation as a journalist". Teaching was represented by three factors -- an "involvement" factor (interest), an "excellence" factor (competence), and a "load" factor (effort). Service was the most complex, being represented by four factors -- community service, university service, departmental service, and professional service. The latter described state level involvements; if professional service occurred at the national level, it was included in the scholarly visibility factor.

3. Payoffs. Two of the five reward factors were unrelated to any accomplishment score. To obtain some rewards, the key has not necessarily been success or "merit". "Travel" and "professional development assistance" were only modestly predicted by selected accomplishments; the highest correlation (.24 between "travel support" and "professional leadership, state) was too low to offer practical advice to a faculty member on how to "merit" travel funds. Only on the

"monetary" factor were the payoffs obvious. A faculty member interested in this type of reward would be well advised to gain scholarly visibility, provide significant university services, and seek teaching responsibilities characterized by high level and low load.

Since most administrators would agree that they want to encourage faculty members to make contributions to research, service, and teaching, it seems desirable to use the entire reward structure to reinforce professional accomplishments.

4. Discrimination. The merit system appeared to exert significant control only on monetary rewards. For a given level of accomplishment, females were provided lower monetary rewards than were males. Therefore, on this reward dimension, the charge of sex discrimination appeared to be upheld.

Post Script

The study was completed in 1972. By 1973, under pressure generated by the Commission on the Status of Women, a mandatory written faculty evaluation program was established. Although criteria and procedures were established by the faculty at the departmental level, careful monitoring was done by the Affirmative Action Office and by the Vice President for Academic Affairs to insure that there was a reasonable correspondence between recommended salary increases and evaluations.

Two studies were done in 1974 to examine the impact of this change (Hoyt, 1974; Hoyt and Clegg, 1974). In the first,

it was found that the salary status of female members had improved substantially from 1971 to 1974. Their salaries were increased by both a higher percentage and by a higher dollar value than was true for male faculty members. The second study showed that, although student ratings of teaching effectiveness were essentially unrelated to salary increments from 1969 through 1973, in 1974 there was a significant correlation. Apparently, the formalizing of faculty evaluation procedures served to increase the relationship between monetary reward and teaching excellence.

Thus, we have some reason to believe that a replication of the investigation reported herein might produce quite different results. And a major explanation for that could be that the original study influenced administrative decisions in such a way as to make replicated results improbable.

TABLE 1

ROTATED FACTOR LOADINGS* FOR REWARD MEASURES

MEASURE	FACTOR A	FACTOR B	FACTOR C	FACTOR D	FACTOR E
1. Sabbatical Leave			.84		
2. Summer Teaching				.85	
3. In-state Travel					.88
4. Out-state Travel				.49	.54
5. Office Space	.91				
6. Office Privacy	.84				
7. Office Storage	.84				
8. Office Location	.64				
9. Secretary Help			.70	.41	
10. Rate of Promotion		.55			
11. Salary		.88			
12. Salary Adjust for Exp.		.93			
PERCENT VARIANCE	23.1	17.1	11.3	9.5	8.8
SUGGESTED NAME	OFFICE QUALITY	MONETARY	PROF.DEV. ASSIST	SUMMER APPT(?)	TRAVEL

*Factor Loadings Below .40 Have Been Omitted.

TABLE 2

DIMENSIONS OF FACULTY ACCOMPLISHMENT[1]

I. SCHOLARLY VISIBILITY (17.5% of Variance)

Article Published	(.72)
Books Published	(.69)
Editor, Readings	(.60)
Papers, Nat'l. Convention	(.61)
Program Partic, Nat'l.	(.57)
Small Res. Grant	(.52)
Local Res. Grant	(.50)
Prof. Assn. Leader, Nat'l.	(.49)

II. COMMUNITY SERVICE (8.1% of Variance)

Chairman, Comm. Board	(.82)
Member, Comm. Board	(.70)
Service Club Leader	(.58)

III. UNIVERSITY SERVICE (6.4% of Variance)

Member, Maj U. Comm.	(.75)
Faculty Senator	(.69)
Chairman, U. Comm.	(.69)

IV. TEACHING INVOLVEMENT (6.0% of Variance)

Discuss Teaching	(.86)
Discuss Courses	(.83)
Advice Sought	(.70)

V. REPUTATION AS JOURNALIST (4.9% of Variance)

Journalism Award, Nat'l.	(.75)
Journalism Award, State	(.74)
Prof. Assoc Leader, Nat'l.	(.42)

VI. PROF. LEADERSHIP, STATE (3.9% of Variance)

Program Partic, State	(.75)
Paper, State Convention	(.70)
Prof. Assoc Leader, State	(.60)

VII. DEPARTMENT LEADER (3.7% of Variance)

Chairman, Dept. Comm.	(.61)
Ph.D. Involvement	(.56)
Teaching Level	(.45)
MA Involvement	(.42)
Local Gov't. Agency Member	(-.48)

VIII. CREDENTIALS VS TEACHING LOAD (3.5% of Variance)

Highest Degree	(.68)
Teaching Level	(.40)
Teaching Load	(-.61)

IX. TEACHING EXCELLENCE (3.1% of Variance)

Won Teaching Award	(.77)
Nominated for Teaching Award	(.68)

1. Factor Loadings Above .40 Shown in ( ).

TABLE 3

SINGLE ORDER AND MULTIPLE CORRELATIONS OF NINE ACCOMPLISHMENT MEASURES WITH FIVE REWARD MEASURES

ACCOMPLISHMENT	Factor A OFFICE	Factor B MONETARY	Factor C PROF.DEV.ASSIST	Factor D SUMMER APPT.	Factor E TRAVEL
I. Schol. Visib.	-02	47	-05	03	18
II. Comm. Service	-02	-06	18	-16	12
III. University Service	07	42	15	-09	19
IV. Teaching Involvement	-07	-01	-12	14	16
V. Reput. Journ.	-08	-13	-11	00	05
VI. Prof. Lead, State	00	08	-01	01	24
VII. Department Leader	-06	10	13	05	02
VIII. Cred. VS Teach. Load	-08	20	-08	10	00
IX. Teach. Excellence	02	08	18	02	-02
Mult. R.	-	.69	.26	-	.35
Predictors	-	I,III,VIII	II,IX	-	III,IV,VI

TABLE 4

DISCREPANCY SCORES FOR THE TWO SEXES ON THREE MEASURES OF REWARD

	MALES (N=137)		FEMALES (N=24)		
	Mean*	s.d.	Mean*	s.d.	t
A. MONETARY REWARD	0.00	.67	-0.33	.76	2.17**
B. PROF. DEV. ASSISTANCE REWARD	0.00	.79	-0.02	.77	0.02
C. TRAVEL REWARD	0.00	.92	-0.08	.74	0.40

* Scores greater than 0 indicate rewards were greater than expected on the basis of accomplishments; scores less than 0 indicate rewards were less than could be expected on the basis of accomplishments.

** P>.05

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